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12-30-58

Annual Supplement

PROJECT #2517

30 December 1958

CONFIDENTIAL

NO CHANGE

NO CHANGE

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The initial reference oscillator requirement specified a unit capable of placing a calibration tone on recorder wire or magnetic tape at a frequency of 1000 ± 0.1 cycles over the temperature range from - 18°C to 38°C. The dimensions of the unit were not to exceed 1" X 2" X 3". Neither the frequency stability specification nor the small package dimensions presents a problem when considered singly; however, a stability of 0.01% within the above dimensions does pose a problem.

Three design approaches were undertaken concurrently: (1) A transistor driven miniature tuning fork, (2) A crystal oscillator, and (3) A unijunction transistor oscillator. The tuning fork unit easily met the frequency requirement but was oversize having the dimensions: 1 1/32" X 2¼" X 4 5/16". Nevertheless, evaluation indicated a satisfactory interim unit and ten additional oscillators (IN-3) were fabricated. The crystal oscillator approach was dropped early because the manufacturer was unsuccessful in an attempt to repackage the crystal in a rugged configuration. Stock units in glass, evacuated envelopes are available but they are fragile, and offer no size or stability advantage over the tuning fork. A prototype unijunction transistor oscillator (IN-9) has been constructed which reduced the size

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4. (Continued)

disparity but stability checks indicate that - 2% is the best that can be expected. Evaluation results indicate that the size reduction does not offset the lower stability factor and as a consequence no additional IN-9 units are required.

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No requirement - project terminated.

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